REMARKS

Claims 1-28 are pending in this application. Claims 19-28 have been withdrawn by the Examiner as the result of a restriction requirement made final. Claim 1 is amended herein to include that the exhaust gas treatment unit comprises an oxidation catalyst and downstream thereof at least one catalytically active component for selective catalytic reduction of nitrogen oxide, and to include that the storage component comprises at least one compound of an element selected from the group consisting of an alkali metal, an alkaline earth metal, and cerium. Support for the amendments to the claims can be found in the specification and claims as filed. Support for the amendment to claim 1 can be found, for example, at claims 5-8 as filed. The specification has been amended at page 7, line 2, to include reference to item (6) in the figures. Support for the amendments to the specification can be found in the specification and drawings as filed. The amendments add no new matter. Applicants respectfully request entry of the amendments.

Objections to the Drawings

The Examiner objected to Figures 2 and 3 under 37 C.F.R. 1.84(p)(5), asserting that reference character "6" in the figures is not mentioned in the specification.

Applicants herein amend the specification under 37 C.F.R. 1.121(b) to include the reference character "(6)" at line 2 on page 7 of the specification as filed.

Objections to the Claims

The Examiner objected to claims 1 and 3, asserting that line 3 of claim 1 should be amended to include "and" before the phrase "of nitrogen oxide." The Examiner asserted that the first line of claim 3 should be amended to change "further comprising that" to "wherein."

Applicants have amended claims 1 and 3 as suggested by the Examiner.

Rejections Under 35 U.S.C. § 112, Second Paragraph

The Examiner rejected claims 9-10 as allegedly indefinite, asserting that claim 9 is unclear as to how the member of the platinum group metals is related to the catalytically active component of claim 1. The Examiner asserted that he could not determine what structural limitations are in claim 10 because he does not know how the catalytically active component of claim 10 is related to the catalytically active component of claim 1.

Applicants respectfully disagree with the Examiner and submit that the claims are not indefinite to a person of ordinary skill in the art in light of the specification.

However, solely in order to expedite allowance, Applicants have canceled claims 9 and 10. Accordingly, Applicants submit that the Examiner's indefiniteness rejections are moot.

Rejections Under 35 U.S.C. §102(b)

The Examiner rejected claims 1-3 as anticipated by DE 198 06 062 (Neufert); claims 1-2, 5-6, 9-11, 13, and 16 as anticipated by EP 0 666 099 (Tsuchitani); claims 1-10, 13, and 16 as anticipated by EP 0 723 805 (Kinugasa); and claims 1, 4, 5, 8-9, and 13-15 as anticipated by EP 0 935 055.(Kamikubo)

Applicants submit that the cited references do not anticipate the rejected claims. Anticipation requires that a single reference disclose each and every element of the claim, *W.L. Gore & Assocs. v. Garlock*, 721 F.2d 1540 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984), explicitly or inherently, and that the reference must disclose the elements arranged as in the claim, *Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co.*, 730 F.2d 1452 (Fed. Cir. 1984). Applicants submit that the cited references do not anticipate the claims, because the cited references do not disclose each and every element of the claims.

The claims include an oxidation catalyst and downstream thereof a catalyst comprising components for selective catalytic reduction and components for storage of

nitrogen oxides. The components for storage of nitrogen oxides comprise compounds of an element selected from the group consisting of an alkali metal, an alkaline earth metal, and cerium. The compounds can ***chemically*** bind nitrogen oxides in the form of nitrates. Neufert does not disclose such a catalyst.

In contrast, Neufert stores nitrogen oxides using Al_2O_3, SiO_2, ZrO_2, zeolites, and layered silicates (see, for example, Neufert at col. 2, lines 26-27). The nitrogen oxide storage material in Neufert primarily stores nitrogen oxides physically—by ***adsorption***, not chemically. Nitrogen oxides in exhaust gases of internal combustion engines consist primarily of nitrogen monoxide (60-80 vol. %, depending on engine operating conditions). Accordingly, for efficient storage of nitrogen oxides during the cold start phase, nitrogen oxides have to be oxidized to nitrogen dioxide; only nitrogen dioxide can react with the storage components to form nitrates. Thus, in contrast to Neufert, the stored nitrogen oxides are only released at higher temperatures, which ensures that the catalyst is well above its light-off temperature when desorption of the nitrogen oxides begins.

Tsuchitani does not anticipate the claims. In contrast to the claims, Tsuchitani does not address selective catalytic reduction (SCR). Selective catalytic reduction includes reduction of nitrogen oxides in an oxygen rich exhaust gas by reacting the nitrogen oxides with ammonia at the SCR catalyst, wherein the exhaust gas can contain 5-15 vol. % oxygen. Reaction of nitrogen oxides with ammonia in an oxidizing atmosphere is highly selective; conversion rates of more than 90% can be achieved. Instead, Tsuchitani discloses hydrocarbons (such as propylene) for use as reducing agents for reducing nitrogen oxides in an oxidizing atmosphere, a process much less selective than SCR employing ammonia. Conversion rates using hydrocarbons are much slower than SCR, since most of the hydrocarbons are directly oxidized rather than reacting with nitrogen oxides.

Tsuchitani, for example, describes two tests for measuring achievable conversion rates. In Test 1, the exhaust gas contains only 2 vol. % oxygen, which is quite low oxygen content when compared with the oxygen content of diesel exhaust, which can

contain up to 15 vol. % oxygen. In spite of low oxygen concentration, the achievable conversion rates are inferior to those of SCR (see, for example, Table 1, showing a maximum conversion of only 80%). In Test 2, Tsuchitani discloses 0.4 vol. % oxygen during introduction of the reducing agent. Accordingly, the exhaust exhaust gas composition is heavily reducing—not oxidizing as in SCR. Stoichiometric exhaust gas of an internal combustion engine contains about 0.7 vol. % oxygen. Thus, in the reducing atmosphere of Test 2, maximum conversion rates of 95% are achieved. However, this is unrelated to SCR in highly oxidizing exhaust gases such as, for example, exhaust gases from diesel engines. Accordingly, Applicants submit that Tsuchitani does not anticipate the claims.

Kinugasa does not anticipate the claims. Kinugasa does not disclose the claimed catalyst. Kinugasa discloses an exhaust gas cleaning system comprising several spatially distinct catalysts. The main Kinugasa catalyst unit comprises an ammonia decomposition catalyst (7), which comprises specific components, some of which are similar to those employed in SCR catalysts (see, for example, Kinugasa at page 7, lines 30-34). Kinugasa also discloses exhaust gas cleaning systems comprising a nitrogen oxide storage catalyst (8) (see, for example, Kinugasa at page 12, lines 36-45). The figures in Kinugasa disclose that the ammonia decomposition catalyst (7) and the nitrogen oxides storage catalyst (8) are spatially separate entities.

In contrast to Kinugasa, the claims include both components for SCR and components for nitrogen oxide storage in one catalyst member. Kinugasa does not disclose such a catalyst. Accordingly, Applicants submit that Kinugasa does not anticipate the claims.

Kamikubo does not anticipate the claims. Kamikubo does not disclose SCR of nitrogen oxides with ammonia. Instead, Kamikubo discloses catalytic reduction of nitrogen oxides with hydrocarbons. The Kamikubo exhaust system comprises two distinct upstream and downstream catalysts (see, for example, Kamikubo Fig. 1, and Kamikubo at page 3, lines 5-12). The upstream Kamikubo catalyst comprises components for adsorbing hydrocarbons at low exhaust temperatures and releasing them

at higher temperatures, wherein the adsorber comprises zeolites (most commonly used for adsorbing hydrocarbons). The upstream Kamikubo catalyst can also comprise NOx-reducing components—but no storage components—selected from the group consisting of copper, cobalt, iron, manganese, silver, indium, iridium, and rhodium (see, for example, Kamikubo at paragraph [0012]). Neither the upstream catalyst nor the downstream catalyst of Kamikubo comprises a mixture of components for SCR with components for nitrogen oxides storage, as in the claims. Accordingly, Kamikubo does not anticipate the claims.

For the reasons stated above, Applicants submit that the claims are patentable in light of the cited references. Further, Applicants submit that the cited references do not render the claims obvious for the reasons stated above.

Rejections Under 35 U.S.C. §103(a)

The Examiner rejected claim 11 as allegedly obvious in light of a combination of Kinugasa and Tsuchitani. The Examiner asserted that the apparatus of Kinugasa is substantially the same as the claimed apparatus, but Kinugasa does not disclose the specific arrangement of the catalytically active component and the nitrogen storage component in the catalyst, and that Tsuchitani discloses that the catalyst is present in a honeycomb structure as a full extrudate or a coating on an inert honeycomb. The Examiner asserted that rearranging the layers for the catalyst is obvious since positioning parts of an apparatus are well within the knowledge of a person of skill in the art.

The Examiner rejected claims 12, 15, 15, and 17-18 as allegedly obvious in light of a combination of Kinugasa and Kamikubo. He asserted that both Kinugasa and Kamikubo disclose substantially the same apparatus as in the rejected claims, but that Kinugasa does not disclose the specific arrangement of the catalytically active component and the nitrogen storage component. As above, the Examiner asserted that rearrangement of the layers is obvious to a person of skill in the art.

Applicants respectfully disagree with the Examiner. None of the cited references, alone or in combination, disclose, teach, or suggest the claims. The Examiner is referred

to the arguments made above in defense of the Examiner's anticipation rejections.

An obviousness determination requires the Examiner to view the claimed invention as a whole, such that "an artisan of ordinary skill in the art at the time of invention ... would have selected the various elements from the prior art and combined them in the claimed manner." *Princeton Biochemicals, Inc. v. Beckman Coulter, Inc.*, 2005 WL 1355127, *5 (Fed. Cir. 2005), citing *Ruiz v. A.B. Chance Co.*, 357 F.3d 1270 (Fed. Cir. 2004). It is improper to "import hindsight into the obviousness determination by using the invention as a roadmap to find its prior art components." *Id.* at *4. "[S]ection 103 requires that there be some suggestion or motivation, before the invention itself, to make the new combination." *Id.*, at *5, quoting *In re Rouffet*, 149 F.3d 1350, 1355 (Fed. Cir. 1998). "Simply identifying all of the elements in a claim in the prior art does not render a claim obvious." *Princeton,* at *6. Applicants submit that under these standards the cited references do not render the rejected claims obvious.

Kinugasa, alone or in combination with any other cited reference, does not render any of the claims obvious. Kinugasa discloses arranging an ammonia decomposition catalyst and an NOx storage catalyst on separate catalyst carriers. Further, the Kinugasa decomposition catalyst is not the same as the SCR components of the claims.

Applicants submit that neither Tsuchitani nor Kamikubo, alone or in any combination with Kinugasa, disclose, teach, or suggest the claims. The Examiner is referred to arguments already made of record above regarding these references. Further, Applicants disagree with the Examiner that arranging the layers for the catalyst is obvious to a person of ordinary skill in the art. Such reasoning does not apply to placement of catalysts or catalyst layers, because the performance of a catalyst depends to a large degree on the interaction of the various components of the catalyst. A person of ordinary skill in the art would not be motivated to place two catalyst layers on top of one another where the two catalyst layers had been disclosed to be positioned on separate catalyst carriers. In contrast, a person of ordinary skill in the art would appreciate that mixing the catalyst components for SCR with the components of an oxidation catalyst would deteriorate the SCR ability because the ammonia would be preferably oxidized by

the oxidation components and thus would no longer be available for the reduction process.

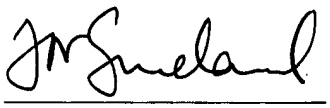
Conclusion

In light of the above, Applicants submit that the cited references do not anticpate the claims, and do not render the claims obvious. Accordingly, allowance of the claims is respectfully requested.

Applicants have enclosed a check in the amount of the fee for a three-month extension of time, an information disclosure statement, and the fee for an information disclosure statement. No additional fee is believed to be due with respect to this filing. If any additional fees are due, or an overpayment has been made, please charge, or credit, our Deposit Account No. 11-0171 for such sum.

If the Examiner has any questions regarding the present application, the Examiner is cordially invited to contact Applicant's attorney at the telephone number provided below.

Respectfully submitted,



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